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# Reasons and subjective effects of cannabis use among people with psychotic disorders: a systematic review

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Cannabis use is a frequent problem among people with psychotic disorders that has been related to a worse prognosis. Understanding the reasons of cannabis use may help to develop comprehensive treatments and, as a result, improve the psychosis course.

**Methods:** A systematic review of studies published in English and Spanish language from 1990 until March 2012 describing reasons for and subjective effects of cannabis use in patients with psychosis were reviewed. However, only those studies in which cannabis use was one of the three main substances studied were included.

**Results:** Initially, 73 studies, of which 12 met the inclusion criteria, were identified. Most of the studies include heterogeneous patients, at different illness stages, and a few studies included a non-psychotic comparison group. The most common reasons for cannabis use were those related with social activities, mood disturbance, relaxation and getting high.

**Conclusions:** The most common reasons for cannabis use in patients with psychosis were related with social activities, mood disturbances, relaxation and getting high. However, a more homogeneous methodology need to be established, including different illness stages, to facilitate the interventions to reduce cannabis use in all phases of psychotic disorders development.

**Key words:** Psychosis, Psychotic disorders, Schizophrenia, Cannabis, Reasons for substance use, Motivations, Subjective effects

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## Revisión sistemática de las razones y efectos subjetivos del consumo de cannabis en pacientes con trastornos psicóticos

El consumo de cannabis es un problema frecuente en los pacientes con trastornos psicóticos y se ha relacionado con un peor pronóstico. Entender las razones de este consumo, puede ayudar a desarrollar planes de tratamiento más integrales y mejorar la evolución de la psicosis.

**Métodos:** Se ha revisado sistemáticamente la literatura publicada en inglés y español desde 1990 a marzo del 2012, que describe las razones de consumo y los efectos subjetivos de las sustancias consumidas en pacientes con psicosis, se han incluido sólo aquellos estudios en los que el cannabis aparece entre las tres principales sustancias estudiadas.

**Resultados:** Se han identificado inicialmente 73 estudios, de los cuales doce cumplen los criterios de inclusión. La mayoría incluyen pacientes heterogéneos, en diferentes fases de la enfermedad y pocos estudios utilizan comparación con sujetos con consumo sin psicosis. Las razones más habituales del consumo observadas son las relacionadas con la actividad social, las alteraciones del ánimo, la relajación y la intoxicación.

**Conclusiones:** Las razones más habituales del consumo en pacientes con psicosis están relacionadas con la actividad social, las alteraciones del ánimo, la relajación y conseguir intoxicarse, pero sería necesario establecer una metodología más homogénea en diferentes fases de la enfermedad para facilitar el desarrollo de intervenciones destinadas a reducir el uso/abuso de esta sustancia en todas las fases de los trastornos psicóticos.

**Palabras clave:** Psicosis, Trastornos psicóticos, Esquizofrenia, Cannabis, Razones de consumo de la sustancia, Motivaciones, Efectos subjetivos

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## INTRODUCTION

Consumption of psychoactive substances is a growing problem among the current population.<sup>1</sup> An approximate prevalence of 50% of substance consumption has been described in persons with mental disease.<sup>2,3</sup> Cannabis is one of the substances consumed most frequently among patients with psychotic disorder.<sup>4</sup> Cannabis consumption in patients with psychosis has been related with worse treatment adherence and worse clinical course.<sup>5,6,7</sup>

Different works have studied the relation of substance consumption, including cannabis, and psychosis. Talamo et al.<sup>8</sup> performed a meta-analysis that compared the scores on the PANSS scale of patients with schizophrenia with substance use problems (including cannabis) and without substance use. They found that patients with schizophrenia and substance abuse problems had more positive than negative symptoms. On the other hand, Potvin et al.<sup>9</sup> performed a meta-analysis to study the severity of depressive symptoms in patients with the diagnosis of schizophrenia and dual pathology (including cannabis). The authors concluded that some patients with dual pathology had more severe depressive symptoms than schizophrenia patients without dual pathology. However, the authors could not explain the causality of these relations. Several hypotheses, not necessarily exclusive, have been established.<sup>10</sup> These explain the relation of cannabis consumption with psychosis: a vulnerability common to the problem of substance use and psychosis; that consumption is secondary to psychosis (self-medication), or that the psychosis is secondary to consumption. The hypotheses most studied is that of the "self-medication" that interprets substance consumption as a way to relieve the symptoms generated by the disease itself.<sup>11-13</sup> Another theory that has been studied is that of using cannabis as a way to improve the side effects of the antipsychotics, principally the classical ones, thus decreasing restlessness, dysphoria and slow down that can be generated by treatment with neuroleptics.<sup>14,15</sup> However, there is still no consensus among the different authors.

Knowing the reasons why patients with psychosis consume cannabis and the subjective effects caused by this substance in them seems to be a key point to understand the relationship between psychosis and cannabis and to be able to develop more adequate treatment plans.

This present work has aimed to review those articles that describe the reasons for cannabis consumption in patients with psychosis and the subjective effects generated by it in order to improve knowledge on the motivation that leads the subjects to consumption and to be able to development comprehensive treatment plans.

## METHODOLOGY

A systematic review has been made of the articles published in the databases of Medline and Google Scholar, using the following keywords: "schizophrenia," "psychosis," "psychotic disorder" in combination with "reasons for substance use," "motivations," "cannabis," "subjective effects." Articles in both English and Spanish published from 1990 up to March 2012 were selected. The studies that described the reasons for consumption and subjective effects of these substances consumed in patients with psychosis were included, however these were limited to those in which cannabis appeared among the three main substances studied. After, some indexed references in the articles initially found that met the inclusion criteria were manually searched for.

## RESULTS

Initially 73 articles were identified, 12 of which met the inclusion criteria (they are described in table 1).

A detailed description of the most conclusive results that are summarized in table 2 are discussed in the following.

### Reasons for consuming cannabis

One of the first articles that approached the question was that of Dixon et al. (1991).<sup>16,17</sup> Their study evaluated the reasons why a total of 83 patients hospitalized with a diagnosis of schizophreniform disorder, schizophrenia and schizoaffective disorder consumed cannabis. The patients were separated into two groups, substance consumers (abuse/dependence) and non-consumers with the objective of evaluating the clinical and social demographical differences of both samples. In order to evaluate the reasons for cannabis consumption, a list of consumption reasons was used (table 3). The authors concluded that 72% of the patients consumed it to feel intoxicated (high) and to relieve their feelings of sadness. A total of 64% of the patients stated they consumed it to relax or to increase their sensation of pleasure and finally approximately 55% of those interviewed attributed consumption to social causes, such as forming a part of a group or facilitating the relationship with others.

Several authors have used a version of this list for the evaluation of the reasons for consumption and their respective studies.

Among them, Addington et al.<sup>18</sup> evaluated the reasons why 41 patients diagnosed of schizophrenia and schizoaffective disorder, 21 of whom had criteria for cannabis dependence disorder, consumed it. They found that 95% reported they consumed it to improve pleasure, positive

Table 1 Summary of the characteristics of the articles included in the review								
Authors	Sample		Diagnosis	Inclusion criteria for substance consumption	Reasons for onsumption		Subjective effects of the substance	
	N	Age (SD)			Methodology	N	Methodology	N
Dixon et al. (1991)	83	30.6 (8.5)	DSM- III- R (SCID): Schizophrenia, D. Schizoaffective, D. Schizophreniform; hospitalized patient	DSM-III-R (SCID): abuse/dependence 6 previous months	Registry in a list	53	Registry in a list; Answers based on increase, decrease or no effect	23
Warner et al. (1994)	55		Schizophrenia, D. Schizoaffective Bipolar Disorder Outpatients	There are no inclusion criteria related with consumption of substances	Semi-structured Interview	55	Interview adapted With responses of improvement, Equal, worse	x
Addington et al. (1997)	41	35 (9.3)	DSM-III-R (SCID): Schizophrenia, D. Schizoaffective Outpatients	DSM-III-R (SCID): Abuse/dependence	Adapted Registry in a list (Dixon)	21	Registry in a list; Answers based on Increase or decrease of effects	21
Fowler et al. (1998)	194	36.3	DSM-III-R (SCID): Schizophrenia, outpatients	Without criteria of abuse/dependence. Interview for consumption in last 6 months.	Open interview	58		
Spencer et al. (2002)	69	31	DSM-IV (SCID): Psychotic Disorder; Hospitalized patient and outpatient	Without criteria of abuse/dependence. Interview for consumption in last years.	adapted Questionnaire Drinking Motives Questionnaire (DMQ) Answers Likert scale	49		
Goswami et al. (2004)	22	33.5 (9.4)	DSM-IV (SCID): Schizophrenia; Outpatients	DSM-IV for abuse/ dependence Cannabis in previous month	adapted Questionnaire (State Reasons Scale), Dixon et al.	5	Questionnaire (adapted Dixon)	5
Green et al. (2004)	45	29.4 (8.5)	DSM-IV (SCID): Schizophrenia and Schizoaffective Disorder	Consumption of 0.25g of cannabis per week for 1 month in last 3 months	Open Interview	45	Open Interview	45
Busquets et al. (2005)	30	29.20 (10.58)	DSM-IV (SCID): Psychotic D.; Hospitalized Patient	Comparison between patients with and without substance abuse/dependence criteria in last 6 months			Questionnaire Addiction Research Center Inventory (ARCI)	20
Schofield et al. (2006)	49	25	Schizophrenia, Schizophreniform D. Schizoaffective D.	Consumption of cannabis in previous 6 months	adapted Questionnaire Dixon et al.	49	Adapted survey to consumption of cannabis Likert scale:	49
Schaub et al. (2008)	36	30.4 (6.8)	DSM IV-TR Schizophrenia	Criteria for cannabis abuse/dependence	15-item Questionnaires	36		
Saddichhha et al. (2010)	91	30	ICD-10 Schizophrenia, Bipolar Disorder	ICD-10 Substance abuse/ dependence	Open interview	91		
Archie et al. (2012)	45	23	DSM IV-TR Affective and non-affective psychosis	No inclusion criteria	Open interview	45		

sensations or simply to become intoxicated. Approximately 80% consumed it to become relaxed and to relieve symptoms of sadness. Finally, about 70% consumed cannabis to belong to a group, to be more sociable or to improve their capacity for socially interacting. A smaller percentage (40%) consumed it to decrease the slow down generated by the medication or to reduce positive symptoms such as distrust or auditory hallucinations. However, it stands out that 50% of the patients stated that the positive symptoms deteriorated with consumption.

Goswami et al.<sup>13</sup> evaluated 22 outpatients with schizophrenia and substance consumption. Of these, only 5 patients consumed cannabis. They also used an adapted questionnaire of Dixon et al.<sup>17</sup> for the evaluation, administering it to 22 patients. The results found among the cannabis users indicate that 80% consumed it to become intoxicated, 60% to decrease anxiety and become relaxed, 40% for social reasons, 40% to decrease positive symptoms and finally 20% to relieve effects related with the medication.

Schofield et al.<sup>3</sup> studied the reasons why 49 outpatients diagnosed of schizophrenia, schizophreniform disorder and schizophrenia consumed cannabis. They also used a questionnaire adapted by Dixon et al. In reference to the reasons why the patients consumed cannabis, 80% were related with social activity and relaxation; 79% to improve boredom; 49% to improve anxiety; 15% to reduce the side effects of the medication and to a lesser degree (11% and 8%), to reduce positive symptoms of the disease (auditory hallucinations and paranoia, respectively).

Other studies, detailed in the following, compared the reasons for cannabis consumption in patients with psychosis in relationship to a consumer group without psychosis. For the evaluation method, they did not use the Dixon et al. questionnaire or an adapted version.

Green et al.<sup>19</sup> performed a prospective study at 4 weeks that evaluated 49 patients diagnosed of schizophrenia and schizoaffective disorder compared to 47 controls without psychosis. The evaluation was performed by telephone interview, asking the subject about the most important reason for consumption and the positive and negative effects of cannabis consumption. The most outstanding reasons at baseline and at 4 weeks of follow-up in the patients were: social reasons (37.8% and 28.9%, respectively), to become intoxicated, feel happy and decreased mood disorders (35.6% and 42.1%, respectively), reduce anxiety (26.7 and 28.9%, respectively) and reduce boredom (22.2% and 31.1%, respectively). The percentages of the controls in relation to the reasons stated by the patients were: social causes 48.9% at baseline and 51.1% at 4 weeks of follow-up, to feel positive sensations in 25.5% and 27.7%, respectively and to reduce anxiety in 10.6% and 21.3%, respectively.

Schaub et al.<sup>20</sup> compared 36 outpatients diagnosed with schizophrenia under treatment with atypical antipsychotics with a control group of students who consumed cannabis, using a 15-item questionnaire to see if the reason for cannabis consumption would be to relieve the side effects of the treatment. The results are similar to the previous studies with higher scores in reducing boredom, becoming relaxed, increasing pleasure, belonging to a group (more than 60%). Only 8% stated they consumed it to relieve side effects of the medication and 19% to relieve auditory hallucinations. The most reported reasons in the control group are intoxication and being able to relax, with percentages greater than 80%.

Another study that compared a group of hospitalized patients with schizophrenia and bipolar disorder and substance dependence, among them cannabis, versus control patients without mental disease with consumption, is that of Saddichha et al.<sup>21</sup> In this study, the authors used an open interview for the evaluation. They classified the reasons in two sections: External Factors and Internal Factors. The results they obtained were that patients with schizophrenia and cannabis consumption attributed consumption to internal type reasons (low self-esteem, consumption craving, mood improvement, improving apathy, affective anesthesia, etc., while the control group predominantly attributed it to external causes (type of work, social pressure, family stress, etc.).

Other studies that have evaluated cannabis consumption in patients with psychosis with no control group and with evaluation methods not based on the Dixon questionnaire are those of Fowler et al.,<sup>19</sup> Spencer et al.<sup>23</sup> and Archie et al.<sup>24</sup>

Fowler et al.<sup>22</sup> studied the reasons for consumption in a sample of 194 outpatients with schizophrenia and substance abuse criteria. The cannabis-consuming patients accounted for 58. A total of 41% reported they consumed cannabis to feel intoxicated, 62% to relieve feelings of dysphoria, mood alterations and finally only 6.9% reported reasons related with the disease or medication.

Spencer et al.<sup>23</sup> evaluated 69 patients admitted to hospital and outpatients with diagnosis of psychotic disorder, without criteria of substance abuse/dependence, but who had consumed cannabis in the last year, with a measurement instrument called The Drinking Motives Measure (DMM) adapted for alcohol and cannabis. The patients with cannabis consumption said that their main motivations were improvement of mood, feeling intoxicated and social reasons. Less relevant motivations were relieving side effects of the medication or symptoms of the disease.

The only study that evaluated the reasons for consumption in patients with a first psychotic episode was that of Archie et al.<sup>24</sup> that evaluated a group of 45 patients

Table 2	Results of reasons for consumption and subjective effects	
Authors	Results (Reasons for Consumption)	Results (Subjective effects) Improvement of:
Dixon et al. (1991)	72% Intoxication 72% improve mood, dysphoria 64% Relax, increase pleasure 55% Social	96% Anxiety 83% Depression 78.3% Relaxation 69.6% Energy 4.3% Hallucinations
Addington et al. (1997)	95% Increase pleasure and intoxication 81% Relax, improve mood 71% Social 40% Disease (extrapyramidalism or positive symptoms)	91% Happiness 24% Anxiety 71% Boredom 71% Relaxation 67% Sociability 14.7% Hallucinations
Fowler et al. (1998)	62% Dysphoria, improve mood 41% Intoxication 6.9% Disease (extrapyramidalism or positive symptoms)	X
Spencer et al. (2002)	Higher score: Improve mood, intoxication, social Lower score: Relieve positive symptoms and effects of medication	X
Goswami et al. (2004)	80% intoxication, relax 60% decrease anxiety, 40% improve mood 40% social 40% Positive symptoms	Anxiety Energy Hallucinations Suspiciousness
Green et al. (2004)	37.8% Social 35.6% improve mood 26.7% Reduce anxiety 22.2% Boredom	62.2% Mood alteration 26.7% Anxiety and depression 11.1% Boredom 48.9% Relaxation 20% Sociability 2.2% Positive symptoms
Busquets et al. (2005)		Search for euphorizing effects
Schofield et al. (2006)	86% Relax 81% Social 58% Insomnia 49% Dysphoria 15% Reduce side effect of medication 11 % Hallucinations 8% Delusional ideas	Anxiety Of mood Of boredom Of the socialization
Schaub et al. (2008)	83% Intoxication 60% Improve mood 19% Hallucinations	x
Saddichhha et al. (2010)	70% Social, improve mood state, intoxication	x
Archie et al. (2012)	70% Social, improve mood state, intoxication	x

with a first psychotic episode using an open interview. The patients reported 3 main reasons: consumption to belong to a group and to feel socially accepted, to improve mood status and simply to feel intoxicated.

### Subjective effects of cannabis consumption

The articles mentioned up to date were mainly focused on discussing the reasons for cannabis consumption.

Table 3	List of reasons for consumption of Dixon et al.	
	REASONS	YES NO
	Intoxication/"to get high"	
	Decrease sadness	
	To become relaxed	
	Increase pleasure	
	Increase energy	
	Belong to a group	
	Increase emotions	
	Be more talkative	
	Be more creative	
	Satisfy curiosity	
	Improve concentration	
	Work and/or study better	
	Relieve side effects of the medication	
	Decrease hallucinations/ suspiciousness	

However, some of them mentioned the subjective effects reported by the patients in addition to the reasons that led them to consumption. For example, Dixon et al.<sup>17</sup> evaluated the subjective effects of cannabis, alcohol and cocaine in mood and the symptoms of the disease in 23 patients. The results they obtained were that the use of cannabis in comparison to other substances reduces anxiety and depression (96 and 83% of the patients, respectively) increases energy (66%) but also deteriorates hallucinations and distrust.

Goswami et al.<sup>13</sup> also evaluated the subjective effects of consumption and found that there was a relationship between the reasons for consuming cannabis and the subjective effects presented with it. The effects identified were improvement of anxiety, sadness and the symptoms related with the disease such as hallucination or distrust.

Schofield et al.<sup>3</sup> explained that the patients explained that consumption of cannabis enabled them to reduce anxiety, feel better, sleep better, improve their mood and decrease boredom. They identified that cannabis sometimes helped them to socialize. The authors added that the symptoms related with the frequency and amount of consumption were affective anesthesia, apathy and sedation.

Green et al.<sup>19</sup> also evaluated the subjective effects of the substances in the four-week perspective study comparing groups of 49 patients with psychosis versus 47 control subjects. The subjective effects reported most by the group of patients are those related with mood disorders (happiness, intoxication, etc.) with percentages of 42.2% at baseline and 62.2% at follow-up and relaxation with 26.7% and 48.9%, respectively. These values also coincide with the effects reported most by the control group, mood alteration and relaxation being the effects described the most.

Green et al. found that the negative effects of cannabis identified most frequently by patients are deterioration of positive symptoms while the control group reported physical effects and cognitive deterioration as negative effects of the consumption.

Busquets et al.<sup>25</sup> studied a sample of 30 patients diagnosed of psychotic spectrum and compared the effects of consumption and those patients with a comorbid disorder related with substance consumption during the 6 previous months with those patients without criteria of abuse/dependence but with substance consumption. Evaluation of the effects of the consumption was performed using the Addiction Research Center Inventory (ARCI) scale made up of 5 scales that evaluated intensity of the effects of the substances with scores from 0 to 11-15. It was observed that patients with abuse/dependence disorder obtained a higher rate of euphoric effects than those who did not have the comorbid substance disorder.

## DISCUSSION

It stands out that only 3 articles of those included in the study compared the reasons for cannabis consumption in patients with psychosis with subjects who consumed cannabis without psychosis. Furthermore, most of these studies included patients in different phases of the psychosis and some included affective psychosis. Regarding the consumption of toxic agents, some studies used abuse/dependence criteria for inclusion while others simply used substance consumption.

In spite of the heterogeneity observed in the evaluation measurements of the reasons for cannabis consumption, four main categories for reasons of consumptions were established in most of the studies, as other authors have stressed<sup>26</sup> 1) improvement in positive sensations (obtaining pleasure, feeling good, feeling more emotions); 2) relieving dysphoria (decreasing sadness, relaxing, decreasing restlessness); 3) Social (belonging to a group of friends, avoiding social isolation, improve expressiveness, being more talkative); 4) related with the positive symptoms of the disease and the medication (decreasing hallucinations, decreasing suspiciousness, decreasing slow down, restlessness or extrapyramidal symptoms generated by the medication).

Within these, we observed that the most common were those of relieving dysphoria, relaxing, followed by social reasons and finally those related with the intoxication and maintenance and improvement of the mood. The reasons clearly related with the disease (positive symptoms) and the medication are in the minority, observing congruency between the results of the different studies that show lower percentages regarding the rest of the reasons. Besides this, we should keep in mind that the control subjects (patients without psychosis with consumption) explain reasons for consumptions that are very similar to the patients with psychosis. The data mentioned would contradict the hypothesis of "self-medication," which postulates that the patients would be consuming in order to relieve the symptoms of the disease. On the contrary, in favor of the hypothesis of "self-medication," we should keep in mind that patients often have partial awareness of disease,<sup>27</sup> so that negative symptoms such as apathy, abulia, mood alteration may be interpreted as primary. Furthermore, the scales used do not clearly evaluate the negative symptoms. Thus, we could not completely rule out a relationship between reason for consumption and symptoms that are secondary to the disease or to the treatment.<sup>28</sup> In fact, some of the reasons frequently attributed to consumption (dysphoria, nervousness) could be symptoms secondary to the disease. In order to be able to elucidate this question, it would be necessary to have more studies comparing patients with psychosis and consumptions versus subjects without psychosis and consumption where the symptoms of the disease would be correlated with the reasons explained for consumption.

Another type of study that could help answer this question is that made by Swendsen et al.<sup>29</sup> Their study attempted to find the relationship between substance consumption and the symptoms of the patient in real time, using electronic devices. This study found that cannabis consumption generally follows states of anxiety and perception of negative events. Furthermore, it found that the positive symptoms deteriorated after cannabis consumption.

On the other hand, we can classify the subjective effects of cannabis described by the patients with psychosis as follows: 1) Related with affect (depression, happiness); 2) Relaxation; 3) Socialization (friendship, loneliness); 4) Physical effects (euphoria, energy, tiredness, etc.); 5) Symptoms and side effects of the medication (paranoia, suspiciousness, confusion, restlessness).

In the results of the study, congruency is observed between the reasons for consumption and the effects obtained by the patients after the consumption. This occurs mainly in the reasons related with the maintenance of mood, where the patients reported subjective effects focused on improvement of affect. However, as we have mentioned,

several studies found deterioration of the positive symptoms with consumption.

## LIMITATIONS

The articles included in the review have marked heterogeneity in relation with the samples, evaluating methodology and expression of results. The samples of the studies published are small, the selection criteria of the participants are unequal, both for mental disease (first psychotic episode, schizophrenia, schizoaffective disorder, induced psychotic disorder, etc), as in the temporal criteria to establish the diagnosis for use, abuse, dependence of the substance to be studied. The evaluation methodology used varies greatly (questionnaires adapted, open interviews, standardized scales, visual analogue scales, etc.), so that the synthesis and unification of the results are more difficult, although several studies have used the Dixon et al. scale for the evaluation. It should also be taken into account that the studies included may have biases, mainly recall, and the answers that may be given under the effects of the intoxication of the drug in question. The fact that the studies presented have been performed over a period of 20 years must also be taken into account, because the concept of the use of cannabis and the frequency of its use may change over the years.

## CONCLUSIONS

The studies conclude that the most common reasons for consumption are those related with social activity, mood alterations, relaxation and becoming intoxicated, showing very congruent results with the subjective effects of the consumption. However, it must be stressed that the positive symptoms of some patients deteriorate. It would be necessary to establish a more homogeneous methodology in order to compare the results. Designing new works that distinguish the reasons for consumption in the different phases of the disease and in correlation with the symptoms in patients with and without psychosis would facilitate the development of interventions aimed at reducing the use/abuse of this substance and thus improve the prognosis of the disease.

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